

Application exercise: 4.1 Comparing two means

Section: 10:05 - 11:20 11:45 - 1:00 1:25 - 02:40 3:05 - 4:20 4:40 - 5:55

Team: _____

1. **Dependent groups:** 200 observations were randomly sampled from the High School and Beyond survey. The same students took a reading and writing test and their scores are shown below. The observed average difference between the two scores is -0.545 points and the standard deviation of the difference is 8.887 points. Calculate the p-value of the hypothesis test for evaluating a **difference** between the average reading and writing scores, and write out a detailed but concise **interpretation** of the p-value in context of the data and the research question.

2. **Independent groups:** We want to test whether there is a **difference** between the average number of hours worked per week by college graduates and those with a HS degree or lower? The average observed difference is 2.4 hrs/week and the standard error of the average difference is found to be 0.89 hrs/week. Calculate the p-value and write out your **conclusion** in context of the data and the research question.

$$\bar{x}_{coll} - \bar{x}_{hs} = 2.4, \quad SE(\bar{x}_{coll} - \bar{x}_{hs}) = 0.89$$

$$H_0 : \mu_{coll} = \mu_{hs} \rightarrow \mu_{coll} - \mu_{hs} = 0$$

$$H_A : \mu_{coll} \neq \mu_{hs} \rightarrow \mu_{coll} - \mu_{hs} \neq 0$$